two small works, shows something of the same defect, the skies containing a mosaic of colours; but, viewed at a distance, these blend, and the effect becomes much improved, particularly in the evening sky of 440. "The Ever Blue Pool" (276) is well named. The reflections of yellow sand dunes and of the curious red scrub growing upon them alike appear in its waters to be blue. Sand dunes are shown in several pictures, in most cases without much success, but a notable exception is found in "The Bay of Aberdovey" (309, Leader). In "Third Year Pollards" (269) Mr. Bertram Priestman has missed an opportunity of indicating the really remarkably rapid growth which occurs in the first year after a pollard willow has been cut. The trees in the picture show no great growth for three years, and have a somewhat hard and unnatural look.

It is not to be expected that men of science will be numerously represented among the portraits in the Academy when there is so wide a choice open among civic authorities, well-known soldiers, and other men high in public esteem. Scientific visitors may this year take pleasure in noting that two fellows of the Royal Society are included amongst the portraits—that veteran man of science and professor of engineering, Dr. Unwin (242), and Sir Napier Shaw (348). Meteorologists may feel proud that their science is represented by the president of the International Meteorological Committee, than whom assuredly no better representative could be found. J. S. D.

Obituary.

MR. BERTRAM BLOUNT.

On April 9 chemistry suffered a loss in the death of Mr. Bertram Blount at the comparatively early age of fifty-four. Never robust, his health had been poor for the past few years; he appeared to be exhausted by his successful struggle in 1915 to bring cotton within the list of contraband goods; for, wonderful as it may seem, it was no light task to convince the Government of the necessity for the step, even with such weighty aid as that of Sir William Ramsay. But of nervous energy Blount had a remarkable store; his staying-power was the admiration of those who knew him as an early cyclist, and later as a pioneer automobilist.

After a few years at King's College School, Blount entered the chemical laboratory of the college, where the foundation of his skill as an analyst was laid by the then professor, C. L. Bloxam. At the age of nineteen he accepted service as an assistant to W. H. Stanger, a consulting engineer to the Crown Agents for the Colonies. His talent did not allow him to remain a subordinate for long; Stanger's practice soon developed to include that of consulting chemist, with Blount as partner. On Stanger's death a few years later Blount continued practice on his own account, and rapidly became a prosperous consultant, the chemistry of cement being his chief subject. His quickness in grasping the meaning of a problem and his undaunted perseverance in attacking it fitted him to be a researcher. His clients' interests, however, left him little time for investigation, so that his contributions to purely scientific literature are limited to a few papers on cement and on minor analytical problems; recently, in conjunction with J. H. Sequeira, he investigated the origin of the colour of Blue John.

Blount was an excellent writer and talker, his style being clear and incisive in both cases. His more permanent writings are "Chemistry for Engineers and Manufacturers," in conjunction with A. G. Bloxam; a "Practical Electrochemistry"; and a recent monograph on "Cement," in conjunction with W. H. Woodcock and H. J. Gillett. He also contributed the articles on cement in the "Encyclopædia Britannica" and in Thorpe's "Dictionary of Applied Chemistry."

WE regret to record the death, on April 21, at seventy-nine years of age, of DR. E. J. MILLS, F.R.S., emeritus professor of technical chemistry in the Royal Technical College, Glasgow.

Notes.

THE observatory founded in 1913 by Sir Norman Lockyer and Lt.-Col. F. K. McClean on Salcombe Hill, above Sidmouth, is henceforth to be called "The Norman Lockyer Observatory." It will thus form a memorial to the scientific pioneer who was described by Dr. Deslandres, past-president of the Paris Academy of Sciences, in our columns as "one of the greatest astronomers of all time." It is proposed to render the memorial more complete by placing in the observatory a portrait of Sir Norman Lockyer, in the shape of a medallion, to be executed by Sir Hamo Thornycroft, R.A. As there are, no doubt, many persons who will value the opportunity of joining in this tribute, the council of the Observatory Corporation has decided not to restrict to a few friends participation in defraying the cost of the medallion, but to invite contributions of any amount from all who may wish to express appreciation of Sir Norman's astronomical work. Names of donors will be recorded in a suitable manner in the observatory. Contributions towards the cost of the medallion should be sent to the hon. secretary of the Observatory Corporation, Capt. W. N. McClean, 1 Onslow Gardens, London, S.W.7.

THE Institute of Chemistry has just issued by order of the council a memorandum prepared by the Special Purposes Committee on Fine Chemicals, Laboratory

Glass and Porcelain. With regard to the production of chemical reagents the council states that a great advance has been made during the war and since by our manufacturers, and this has already enabled professional chemists to obtain practically the whole of the reagent chemicals necessary for their work. Many instances have proved that British manufacturers are capable of producing chemicals in a state of purity fully comparable with that of pre-war supplies from abroad, and the council emphasises the importance of encouraging home production. It is not suggested that chemists should be hampered for lack of chemicals if they cannot be obtained in this country in sufficient quantity and of the right degree of purity, but the council urges that users of chemicals should make themselves acquainted with what is available as the result of the very substantial progress made by British manufacturers, and consider the ultimate effect of failing now to aid in building up a stable chemical industry in this country. In respect of glass apparatus, members of the council are aware that many complaints are made with respect to the quality and quantity of laboratory glass sold as of British origin, "but, so far as they have been able to obtain evidence at present, the complaints regarding glass of recent manufacture marked with the names of known makers have been few in number." The council repeats and emphasises the appeal recently issued by the institute to users, urging them to purchase only laboratory glassware which bears the manufacturer's distinctive marks, and it adds that "if *bona-fide* British manufacturers who are prepared to guarantee their productions by their own marks do not receive proper encouragement, the opportunity of establishing firmly the British scientific glassware industry will be lost, and this at a time when through enterprise and research success in respect of manufacture and technique has been attained."

THE *Times* announces that Sir Ernest Cassel has devoted the munificent sum of 225,000*l.* to the object of founding and endowing a hospital or sanatorium for the treatment of functional nervous disorders, and has purchased a fine mansion and park at Penshurst, Kent, for the purpose. The King and Queen have consented to become patrons of the new institution.

A NUMBER of distinguished civil, mining, metallurgical, mechanical, and electrical engineers of the United States will arrive in England near the end of next month, and will hold a joint meeting with British engineers in July. The American engineers will present Sir Robert Hadfield on June 29 with the John Fritz medal, which was awarded to him recently in recognition of his invention of manganese steel. Previous recipients of the medal have been Lord Kelvin, Mr. Edison, and Dr. Graham Bell.

A DISCUSSION on "The Structure of the Atmosphere up to Twenty Kilometres" will take place in the rooms of the Royal Astronomical Society, Burlington House, London, on Friday, May 6, at 5 p.m. The chair will be taken by Dr. G. C. Simpson. Sir Napier Shaw will open the discussion, which will be continued by Col. E. Gold, Mr. W. H. Dines, and Mr. F. J. W. Whipple.

THE President of the Board of Trade, by arrangement with the Lord President of the Council, has appointed Mr. J. E. Sears, jun., to be Deputy Warden of the Standards in succession to Major P. A. MacMahon, who has retired under the age-limit. Mr. Sears is superintendent of the metrology department at the National Physical Laboratory, and will continue to hold this post in addition to that at the Standards Department of the Board of Trade.

THE award of a Moseley studentship for research in molecular physics or some allied branch of science will shortly be made by the council of the Royal Society. The studentship is of the value of 300*l.* a year and tenable in the first instance for one year only. It may, however, be renewed for a further year if the student's work be considered satisfactory. Applications must be made to the Secretaries of the Royal Society, Burlington House, W.1, before June 1.

APPLICATIONS for two Mackinnon research studentships, each of the annual value of 150*l.*, are invited by the Royal Society. One of the studentships is for research in physical science and the other for research in biological science. The appointments are for one year, but are renewable for a further like period. In exceptional circumstances they may be extended to a third year. Full particulars and forms of application are obtainable from the Assistant Secretary of the Royal Society. The latest date for the receipt of applications is June 1.

THE Council of the Institution of Civil Engineers has made the following awards for papers read and discussed during the session 1920–21:—A Telford gold medal and a Telford premium to Mr. George Ellson (London); Telford gold medals to Sir Murdoch MacDonald (Cairo) and Dr. T. E. Stanton (Teddington); a George Stephenson gold medal to Mr. R. G. C. Batson (Teddington); a Watt gold medal to Mr. S. A. Main (Sheffield); and Telford premiums to Mr. Algernon Peake (Sydney, N.S.W.), Mr. L. H. Larmuth (London), Mr. H. E. Hurst (Cairo), Prof. T. B. Abell (Liverpool), and Mr. Percy Allan (Sydney, N.S.W.). The council further records its appreciation of the paper contributed (jointly with Mr. Main) by Sir Robert A. Hadfield, a member of the council.

IT is announced that the annual meeting of the British Medical Association will be held at Newcastle-upon-Tyne on July 15–23, under the presidency of Prof. David Drummond. On the occasion of the president's address on July 19 the gold medal of the association will be presented to Sir Dawson Williams, editor of the *British Medical Journal* since 1898, in recognition of his distinguished services to the association and the medical profession. In connection with the annual meeting in 1922 to be held at Glasgow, Sir William Macewen, Regius professor of surgery in the University of Glasgow, is announced as president-elect. The council of the association has recommended that the annual meeting in 1923 be held at Portsmouth.

FROM a recent copy of the *North China Herald* we learn with pleasure of the award by the French Government of the Cross of the Legion of Honour to Father Froc, S.J., who for more than a quarter of a century has been connected with the meteorological work at Siccawei Observatory. It was at the Jesuit observatory in Manila that Father Faura in 1879 for the first time predicted the existence, duration, and course of a typhoon in the Far East, and the work at both Manila and Siccawei has been of the greatest importance to those who sail the China seas. Siccawei, which stands about four miles from the international settlement of Shanghai, derives its name from a distinguished Chinese who was converted to the Christian faith by Matthew Ricci three hundred years ago, and whose grave lies close to the observatory. Besides the observatory the Jesuit Mission has here a fine cathedral, a college, an orphanage, a convent, and a natural history museum. The work of Father Froc and of his colleagues, Fathers Chevalier and Gauthier, has the support of the community at Shanghai, and the observatory at Siccawei and those at Zosé and Liu-ka-pong connected with it are an object-lesson to the Chinese Government.

THE Danish explorer Mr. Knud Rasmussen is planning to leave Copenhagen on May 25 in his motor schooner *Sea King* for the Canadian Arctic Archipelago in order to continue his researches in Eskimo ethnography and migrations. Mr. Rasmussen recently laid his plans before the Royal Geographical Society of Denmark. According to the *Times*, he proposes to sail for the station of Thule, in north-western Greenland, where several Eskimo and a number of dogs will be embarked. From there he will go to Hudson Bay and establish his base at Lyon Inlet, in Melville Peninsula. During autumn and winter the tribes around Fury and Hecla Straits will be visited. In the spring of 1922 the expedition will go south to Chesterfield Inlet, where arrangements have been made with the Hudson Bay Co. to form a food depôt. The winter of 1922–23 will be spent among the Kinipetu tribes in the Barren Lands, and other tribes along Maud Sea and Dease Strait. The *Sea King* will take the collections back to Denmark in 1923, while Mr. Rasmussen with a sledge party hopes to reach Thule, travelling *via* Baffin Land, Lancaster Sound, Jones Sound, Ellesmere Sound, and Smith Sound. This journey is expected to throw light on the ancient Eskimo migrations from Bering Strait *via* Coronation Gulf and Baffin Land to Greenland. Mr. Rasmussen's companions will be Messrs. P. Freuchen, Mathiessen, and Birket-Smith.

THE Research Defence Society has issued a pamphlet entitled "The Fight against Disease" (Macmillan and Co., 6*d*.). The pamphlet gives a summary of important current researches on the prevention of human diseases, such as those of Nathan Raw and Calmette on immunisation against tuberculosis, an abstract of Bassett-Smith's lecture on Malta fever at the Middlesex Hospital and quotations from Sir Charters Symond's Hunterian oration on the importance and value of experiments upon animals. The advantages gained by animals from experiments on animals are also emphasised, notably in the case of glanders. Prof. Hobday points out that in 1901 some 2370 horses were destroyed for glanders in Great Britain, whereas during 1920 only 22 animals were destroyed, and this after the sale and distribution of 150,000 Army horses and mules. This result is due to the use of mallein, a sure test for the presence of the disease. The extraordinary mistakes and misstatements of anti-vivisection publications are also referred to and exposed.

THE Report of the Director-General of Public Health, New South Wales, for the year ending December 31, 1919, contains a useful summary of the influenza epidemic which raged in the State during that year. In Sydney itself it is estimated that 290,000 persons were attacked, or 36 per cent. of the population, and from January–September 6244 deaths due to influenza were recorded in the State. As in this country, males of working age had the highest death-rates, and the disease was frequently accompanied with hæmorrhages. The precautionary measures taken included restrictions upon travelling, the provision of hospital accommodation and of medical and nursing assistance in the homes of the sick, notification, isolation of patients and contacts, restriction of public assemblies and closure of schools, and the wearing of masks in certain circumstances. These measures, however, did not appear to limit the spread of infection. Inoculation was also applied to a limited extent, and the death-rate among the inoculated seemed to be decidedly reduced. Extensive bacteriological and pathological investigations were carried out by Dr. Cleland, who thinks that the balance of evidence is in favour of the disease being caused by a filter-passing organism, although no definite experimental evidence in favour of this view was obtained.

THE Natural History Society of Rugby School has recently issued its annual report for 1920, which we note is the fifty-fourth issue of this record. In all, nine general lectures were given during the year on a variety of subjects; brief abstracts of each are printed, and if we are to judge by the attendances recorded, that by Dr. Fournier d'Albe on the optophone was by far the most popular. The report also contains a list of birds of Rugby by Mr. J. F. Madden, compiled chiefly from the society's reports of the last six years; one hundred birds are mentioned, and remarks are added indicating where and how often each has been seen. The botanical section has contributed a list of some three hundred plants which have been found locally, and their dates of flowering are given. The entomological and the ornithological sections also supply lists which will be useful to students of local natural history, while the contribution of the latter is illustrated by some good reproductions from photographs of birds' nests and young sparrowhawks. Other groups, such as the geological, meteorological, photographic, and agricultural sections, have also provided brief reports of their activities, making altogether an attractive record of a year's endeavour in the field of natural history. A new feature upon which the society is to be congratulated is the opening of a laboratory in which members can carry out a certain amount of independent work.

MRS. MABEL C. WRIGHT describes a new conchostracan genus under the name Limnestheria from the Coal Measures of Kilkenny, which have been fertile in interesting fossil forms, ranging from limuloids to amphibia (Proc. Roy. Irish Acad., vol. xxxv., sect. B, p. 187, 1920). The specimens, including antennæ and limbs, are beautifully preserved in pyrite in Carboniferous shale, and were received by the Geological Survey of Ireland from a depth of 830 ft. in the cores of a recent boring. The author concisely reviews the eight known living genera of Conchostraca, and shows how Limnestheria, on the analogy of the highly fertile Limnadia, illustrates the geographic and climatic conditions of the epoch in the Leinster coalfield.

ENTOMOLOGICAL Bulletin No. 872 of the U.S. Department of Agriculture deals with "Insect Control in Flour Mills." Mr. E. A. Back, the author of the publication, confines his attention to the Mediterranean flour-moth, which is by far the most serious pest. He divides control measures into three classes: Preventive, including attention to cleanliness; natural control by means of parasites; and artificial control. A large proportion of insect infestation in flour-mills is directly due to lack of cleanliness, and much may be achieved by thorough cleaning once every five weeks throughout the summer months. The utilisation of parasites cannot be depended upon in any part of the United States. Artificial control has been advocated along various lines, and there have finally emerged two measures that have now proved their value, viz. fumigation by hydrocyanic acid gas and control by heat. The former method is disagreeable and dangerous, and elaborate precautions have to be taken. There are also certain beetle pests which are more resistant to the effects of the gas, and the most satisfactory method for controlling *all* classes of mill-infesting insects is the application of a temperature of 118° to 125° F. To carry out this process effectually the installation of radiators or radiation surfaces is necessary. It has been estimated that this can be fitted up sufficiently economically in an average-sized mill to pay in five years for the cost of its introduction; the heat does not affect the baking qualities of the flour.

THE United States Geological Survey has published a preliminary summary of the mineral resources of the United States in 1919. The value of such statistics of production, etc., at an early date is very obvious, although it is to be hoped that in future years their compilation may be completed in less than nine months. The importance of the present set of statistics lies in the fact that they include 1913, the last pre-war year; 1918, the year of the maximum intensity of production for war purposes; and 1919, the first year of the return towards more normal industrial conditions. Thus, to take the most important of all, namely, coal, it is shown that the production in 1913 was 569,960,219 (short) tons; in 1918, 678,211,904 tons; and in 1919, about 544,263,000 tons. The position is similar in most other important minerals, the output in 1919 being considerably less than the intensive figures reached in 1918, but in most cases not far behind those of 1913. The importance of having such statistics as these available at an early date, even though they may not be absolutely accurate and may need some little later revision, cannot be too strongly emphasised.

THE weather was so persistently mild and dry during the past winter that a comparison with previous winters may be of interest. The Greenwich mean temperature for each of the six months October, 1920–March, 1921 was above the average. The mean for the whole period was 45·0° F., the excess for the six months amounting to 2·6°. The greatest excess was 7° for January, while for March the excess was 4°. There have been two milder winters since 1841, that of 1898–99 having a mean of 45·4°, while for 1913–14 the mean was 45·2°. For each of the winters 1911–12 and 1876–77 the mean was 45·0° F., in absolute agreement with the past winter. Frost occurred in the shade on thirty nights during the past six winter months, the greatest number of frosty nights, ten in number, having occurred in November. There have been eight winters since 1841 with fewer frosts, the least number being nineteen recorded in 1883–84. Rainfall was below the average in each month except perhaps December, which, however, was dry compared with the Greenwich average for a hundred years. The total fall for the winter was 6·87 in., which is about 5 in. less than the normal. There have been only three drier winters since 1841; the driest was 1879–80 with 5·54 in. of rainfall, followed by 1858–59 with 6·65 in. and by 1897–98 with 6·85 in.

THE equation $UV = -f^2$, where U and V denote respectively the distance of object and image from the focal planes of a thin lens, is not so well known as the equation $1/v - 1/u = 1/f$, which gives the distances from the lens itself. We have received a booklet from Prof. Mohd. A. R. Khan, Nizam College, Hyderabad, in which the former equation is graphed and applied in detail to different elementary cases with the view of encouraging its use by students of elementary optics.

WE have received from Messrs. R. and J. Beck, 68 Cornhill, E.C.3, a catalogue of microscopes and microscopical apparatus. The standard London microscope, Model I., has been designed to fulfil the specification prepared by the British Science Guild for a standard microscope, and is supplied in four types. Stand No. 3211, which is suitable for ordinary bacteriological work, includes condenser, three eyepieces, $\frac{2}{3}$ in., $\frac{1}{6}$ in., and $\frac{1}{12}$ in. o.i. objectives, dark-ground illuminator and stop for the oil-immersion objective, and a set of Sloan objective changers, and is listed at 33*l*. 11*s*. (December, 1920). A detachable form of mechanical stage costs an additional 6*l*. A new electric lamp for the microscope has also been designed for use with a "Pointolite," a half-watt, or a metal filament lamp. Another piece of apparatus at a moderate price is the Beck photomicrographic camera.

IN *Science* of March 25 Dr. I. Langmuir attempts to modify the "cubical" model of the atom, in which the outer electrons are supposed to be practically at rest, so as to obtain the well-known results in connection with spectra which were achieved by the entirely different atomic model due to Bohr. It is shown that on the assumption of a repulsive force $F_q = 1/mr^3(nh/2\pi)^2$ between the positive nucleus and an electron, in addition to the Coulomb attractive force $F_c = Ze^2/r^2$, the equations for the radius of the electronic orbit, the total energy in any stationary state, and the frequency of revolution of the electron in the Bohr atom are obtained. The symbols denote: m = mass of nucleus, Ze = charge on nucleus, r = distance between electron and nucleus, h = Planck's constant, and n is an integer denoting the quantum state of the electron. The assumption of the particular law of force for F_q is, however, entirely arbitrary, and was chosen to give the results obtained.

AT a meeting of the Institution of Civil Engineers on April 19 a paper on "The Measurement of the Discharge of the Nile through the Sluices of the Assuan Dam" was jointly presented by Sir Murdoch MacDonald and Mr. H. E. Hurst. The paper describes a series of observations taken to determine accurately the discharge by means of the volumes of water passed into a masonry tank having a capacity of 22,000 cubic metres, which was constructed for the purpose of forming a water-cushion to protect the rock surface on the down-stream side of the dam. The results of the measurements, which are believed to be correct within 1 per cent., showed that (*a*) for a given opening the coefficient of discharge increases as the head increases until, in the neighbourhood of 10 metres head, it becomes constant; (*b*) for the small openings, 1·5 and 2·0 metres, there is not much difference between the coefficients for the same head, and the coefficients for both openings attain practically the same maximum value; and (*c*) for the small heads there is a progressive decrease of coefficient as the size of the opening increases. For heads greater than 3 metres this effect is reversed, and the coefficient increases with increase of sluice-opening. Experiments were also made to determine the coefficients of discharge of other types of sluices of the dam which differ in dimensions and in the levels of their sills. The results of these experiments are stated and discussed. Some observations are added on the accuracy of Gurley current-meters.

THE lighting of ships at sea, which was the subject of discussion at the last meeting of the Illuminating Engineering Society, offers a number of interesting problems. The society was fortunate in receiving the co-operation of representatives of the Admiralty and of the Mercantile Marine Service Association, some of whom gave interesting accounts of their difficulties when oil-lanterns were the only illuminants available. One gathers from the discussion that in many cases the degree of light provided is much less than that usual on land, and this must affect the safety and efficiency of work in the hold of the ship. Among special problems mentioned the lighting of the chart-house and compass-dials deserves attention. Naturally, concealed lighting is recommended in this case, one approved method being the lighting of charts mounted between sheets of glass by diffused light transmitted from below. Another interesting question raised in the discussion was the amount of light desirable on the deck of a ship. Shipmasters were inclined to view with disfavour the use of lights on deck, on the ground that, in contrast with the dense surrounding darkness, they would dazzle the eyes and interfere with operations on deck in sailing-ships, as well as affect the "look-out." It may be presumed, however, that this depends much on the nature of the lighting, and that these objections would be less if the actual sources could be effectually screened from view. To a landsman the idea of working constantly on a violently moving ship in complete darkness seems inevitably accompanied by risk and inconvenience such as moderate diffused lighting might diminish.

WE have received a copy of the first of a new series of catalogues issued by the Science Museum at South Kensington. It is intended that each catalogue shall treat of a single group of the collections and contain illustrations of a few important objects; by these means the price can be kept within reasonable limits, and the visitor need purchase no more than he actually requires. Eventually the new series will cover the whole of the collections in the museum and take the place of the existing catalogues. The present part (1*s*.) deals with machine-tools and metal-working and wood-working machines; descriptive and historical notes are included. The compilers of the catalogue clearly have in view the meeting of the requirements of the visitor or purchaser who is interested in one particular class of exhibits, and such will find that the arrangement of the catalogue is good and that the notes appended to each exhibit have been admirably written. The value of the illustrations given may be questioned; these comprise twenty-two photographic representations of selected machines. If the purchaser is also a visitor he will certainly not require these illustrations, having the actual model or machine before him. If he is not a visitor photographs will help him in a minor degree only, and we should like to suggest that a few line-drawings showing the mechanism or the principle of the mechanism would constitute a very valuable addition to the catalogue. The idea of section catalogues is a sound one, and we hope that the authorities will develop it in such a manner as to meet the need which all students have experienced in visiting the Science Museum, viz. to provide a record to which reference may be made at any future time, confident that the method of working and arrangement of any of the exhibits will be understood.

MESSRS. A. GALLENKAMP AND CO., LTD., of Sun Street, Finsbury Square, E.C.2, have issued a list (No. 71) of students' balances and weights of British manufacture. The prices seem very moderate, and the construction and sensibility of the instruments are such as will make them suitable for teaching purposes in schools.

BEGINNING with the number to be published on July 15 next, the *Psychic Research Quarterly* will be incorporated in a new quarterly review entitled *Psyche*, which will deal with applied and general psychology in relation to education, psycho-analysis, industry, religion, social and personal relationships, psychical research, etc. A special feature of the periodical will be the literary section. The publishers will be Messrs. Kegan Paul and Co., Ltd.

THE first number of a new publication, *State Technology*, has been received. The journal is to be the official organ of the Institution of Professional Civil Servants, which was founded in 1918. A novel feature of the first issue is the inclusion of short abstracts of the proceedings of technical institutions and a paper on a technical subject. The journal will thus assist in providing a means of communication between the technical, scientific, and professional workers in the service of the State, and may also serve to acquaint men of science generally with some of the activities of our numerous Departments of State.

MESSRS. BOWES AND BOWES, 1 Trinity Street, Cambridge, have just issued a handy classified catalogue (No. 404) of second-hand books, journals, and monographs dealing with many departments of science. The scope of the catalogue will be seen from the following sections into which it is divided:—Journals, Transactions, and Proceedings of Learned Societies; Travels, Expeditions, etc.; Biographies of Scientific Men; General Science, including Evolution, Microscopy, etc.; Biology; Botany; Zoology; Geology, including Mineralogy; Anthropology, Ethnology, etc.; Chemistry and Physics; and Portraits of Scientific Men. Upwards of 900 works are listed, and the prices asked are very moderate. The catalogue is obtainable upon application.

Our Astronomical Column.

REID'S COMET.—This comet has been readily visible with the naked eye provided its position was known. In the telescope it has been most conspicuous with a large coma, a stump of a tail, and a nucleus which, as Mr. G. Merton expresses it, is planetary rather than stellar in character. It will be nearest to the pole (distance 4½°) on May 9. The following is a continuation of the ephemeris from M. Ebell's latest elements. A little sweeping may be necessary to locate the comet (this remark applies also to the comet Pons-Winnecke, which was readily visible with 6-in. aperture on April 28, and was glimpsed by Dr. W. H. Steavenson with 2-in.):

Ephemeris of Reid's Comet for Greenwich Midnight.

		R.A.			N. Decl.		Log r	Log Δ
		h.	m.	s.	°	′		
May	12	6	21	6	81	36	0·0044	9·9128
	14	7	3	17	77	59		
	16	7	23	48	74	35	0·0066	9·9636
	18	7	35	47	71	29		
	20	7	43	37	68	42	0·0108	0·0129
	22	7	49	10	66	11		
	24	7	53	18	63	55	0·0167	0·0590
	28	7	59	9	60	1	0·0243	0·1011
June	1	8	3	9	56	45	0·0333	0·1396
	5	8	6	7	54	0	0·0434	0·1745

PHOTOGRAPHIC CATALOGUE OF THE GLOBULAR CLUSTER MESSIER 15.—This bright globular cluster is situated near the western edge of Pegasus. Two exposures on it were made with the Bonn astrographic equatorial (aperture 280 mm.) on 1916 November 16 and 1917 September 24 (exposures 150m. and 90m. respectively) by Prof. Küstner. The positions and proper motions of eight reference stars (re-observed at Bonn by Mönnichmeyer) are discussed in *Veröff. der Univ. Sternwarte zu Bonn*, No. 15, and a catalogue is deduced giving magnitudes and rectangular co-ordinates of 1137 stars in the cluster. Their magnitudes (excluding one star, mag. 8·07, probably superimposed on the cluster) range from 13 to 16½, their X coordinates from $-541''$ to $+495''$, and their Y coordinates from $-531''$ to $+509''$. A similar research in a few decades will render it possible to pick out the stars optically projected on the cluster. No appreciable change in the positions of the cluster stars can be expected until centuries have elapsed.

Photographs with a time-interval of forty-four years are now available for the clusters h and χ Persei. Measurements of these plates were discussed in a paper by the Rev. H. E. Macklin, S.J., presented to the March meeting of the Royal Astronomical Society. He concluded that the few stars showing displacement in the interval were optically projected on the clusters, and further showed that fifteen of them appeared to belong to the moving cluster in Perseus.

A PHOTO-ELECTRIC STUDY OF ALGOL.—Prof. Joel Stebbins, who in 1909 detected the secondary minimum of Algol with his selenium photometer, has recently (*Astrophysical Journal*, March, 1921) published a still more refined research which he has made with the photo-electric cell. He has incidentally detected that δ Persei is variable to the extent of 0·04 magnitude, and in his later work he used l and π Persei as his sole comparison stars, Algol's light being reduced by a neutral shade-glass. On the whole, the new research confirms the old very closely, but there is evidence that the components are ellipsoidal, with a flattening of about 1 in 50. The secondary star appears two-thirds as bright with the new cell as with the selenium one; it is inferred that it is yellower than the primary, perhaps of spectral type G_0. Endeavours have been made to determine the light of the third component, with period of 1·9 years, revealed by the spectroscope, but this has not yet been done with certainty. The greater brightness of the side of the secondary turned towards the primary is confirmed, though the range is diminished. Taking the light of the whole system as unity, that of the two faces of the secondary is 0·075 and 0·045 respectively. The values found before were 0·102 and 0·058. The area of the bright body obscured at principal minimum is now given as 0·700, and the cosine of the inclination of the orbits as 0·142. It is satisfactory to note that the greater precision of the new results is accompanied by a reduction in the time of observation. "The new curve represents half the effort of the old one."